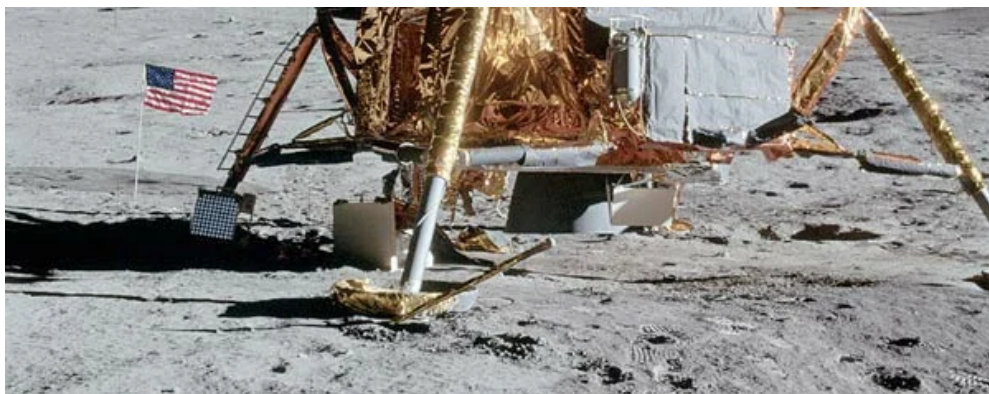


56. Mars rovers land in clouds of dust, but remain clean. Animation instead of real video filming?

11-13 minutes

Once, looking at the pictures of the "Lunar Apolloniada", namely the photographs of the lunar landing, many asked the questions: "Where is the dust under the nozzle of the lunar module? Why is there no funnel from the working engines? And why the bowls of the supports are pristine after landing, as if on them the cleaning lady walked with a rag? "



There is no funnel or dust under the lunar module.

There is no funnel or dust under the lunar module.

And this despite the fact that the first astronauts described that they had to land on the moon in clouds of dust.

At a height of 12 meters, Aldrin reported that moon dust was rising. But he rarely looked out the window. Armstrong, in his post-flight survey, said that he first noticed rising dust at a height of just under 30 m. ... In a thick veil of moving flying dust, it was very difficult to follow static stones and, accordingly, determine the vertical and horizontal speeds.

The astronauts sat in the dust, which rose to a height of 30 meters, and then it suddenly disappeared somewhere. And now a similar situation

is repeated with the American rover. At first, on the frames of the "live broadcast", we were shown how from the streams of hot gas escaping from the nozzles of the "sky crane", the Martian dust rises to a height of over 20 meters. 20 meters is the distance from the rover's wheels to the top of the "sky crane" at the time of landing (according to NASA).



A cartoon explaining how the "sky crane" works.

A cartoon explaining how the "sky crane" works.

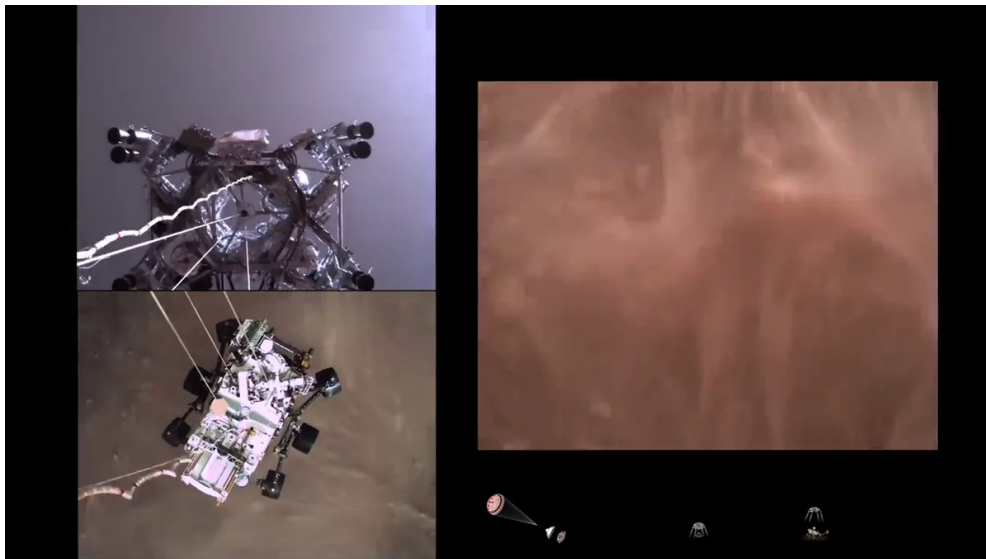
And now, not in computer animation, but as if in a real video recording from Mars, we see that the reactive braking system (sky crane) at the moment of departure is completely hidden in the dust.



The reactive braking system, separated from the rover, is barely visible through the dust.

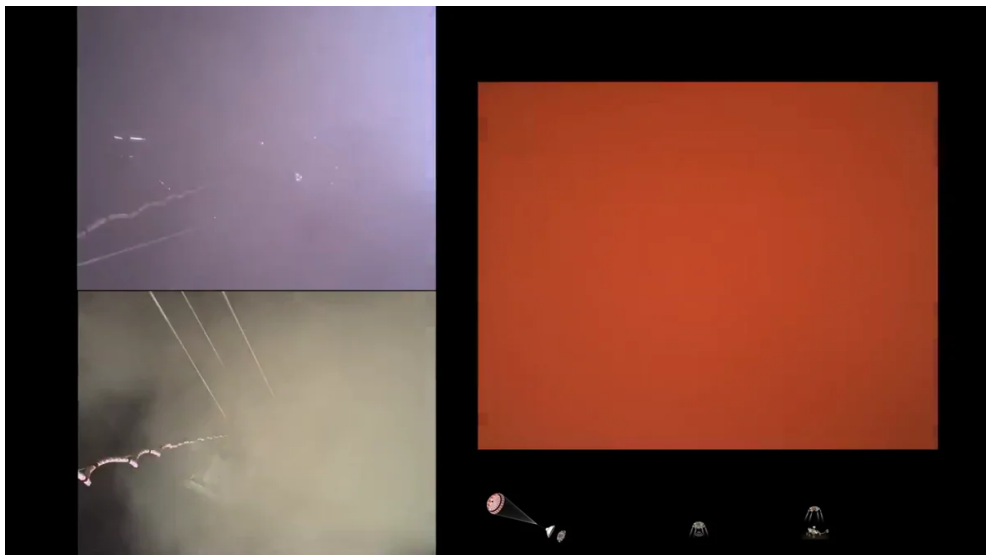
The reactive braking system, separated from the rover, is barely visible through the dust.

A camera attached under the bottom of the reaction brake system shows that the attachment cables and the connecting cable completely hide the dust rising from the surface.



The Sky Crane (top left) and the rover (bottom left) above the surface of Mars.

The Sky Crane (top left) and the rover (bottom left) above the surface of Mars.

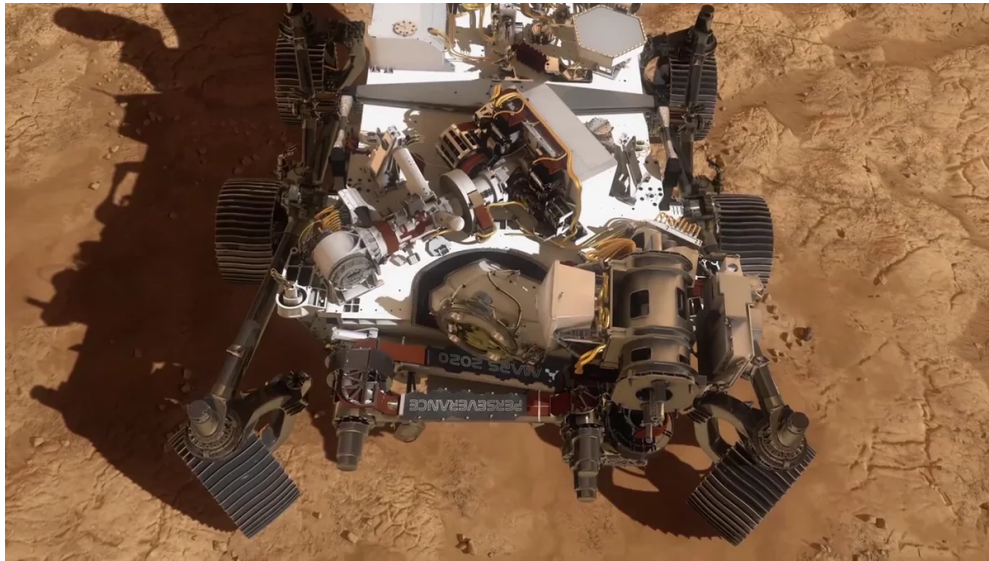


The landing of the device on Mars takes place in dense clouds of dust.

The landing of the device on Mars takes place in dense clouds of dust.

This dust, apparently, should cover the entire rover with a noticeable layer, settle on the lenses of numerous cameras. But I did not notice at least some kind of dust protection on the rover's photo and video cameras. And there are 25 cameras. The only thing that I found on the

computer video was that the manipulator arm (mast) with the main cameras was tilted down with the lenses when landing. But there are cameras directed upwards, but for some reason the dust has not settled on their surface.



The loader mast is lowered down.

The loader mast is lowered down.

When we filmed the passage from the car in the steppe of Kazakhstan, the video cameras were carefully covered with polyethylene from dust.



Camcorders are protected from dust for filming in the steppe of Kazakhstan.

Camcorders are protected from dust for filming in the steppe of Kazakhstan.

How was this problem solved on rovers? I believe that this is an urgent issue, since, as we are told, dust storms are constantly raging on Mars, because of this, huge masses of sand rise into the atmosphere of Mars. And they, too, must settle on rovers.

This is how the aftermath of a sandstorm in Australia looks like:



And like this - in Saudi Arabia:



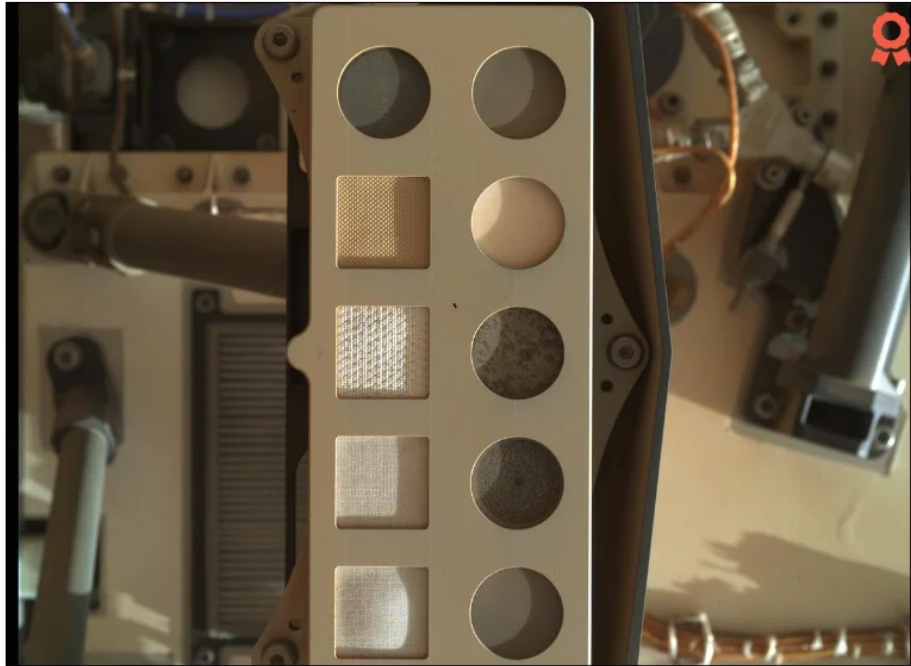
Someone says that Martian dust is constantly hanging in the atmosphere. Because of this, the color of the atmosphere itself allegedly changes. BUT [someone says \(www.astronaut.ru\)](http://www.astronaut.ru) that the dust

content in the atmosphere of Mars is about the same in quantity as in the atmosphere on Earth.

"Dust storms, well observed in the images taken from orbiters, turned out to be hardly noticeable when shooting from the landing vehicles. The passage of dust storms at the landing sites of these space stations was recorded only by a sharp change in temperature, pressure and a very weak darkening of the general background of the sky. A layer of dust, that settled after the storm in the vicinity of the Viking landing sites was only a few micrometers, all of which testifies to the rather low carrying capacity of the Martian atmosphere. $\cdot 10^{-5}$ to $1.66 \cdot 10^{-3}$ g / cm². Thus, the total weight of dust particles in the atmosphere of Mars during the period of global dust storms can reach 10^{18} - 10^{19} tons, which is commensurate with the total amount of dust in the earth's atmosphere. "

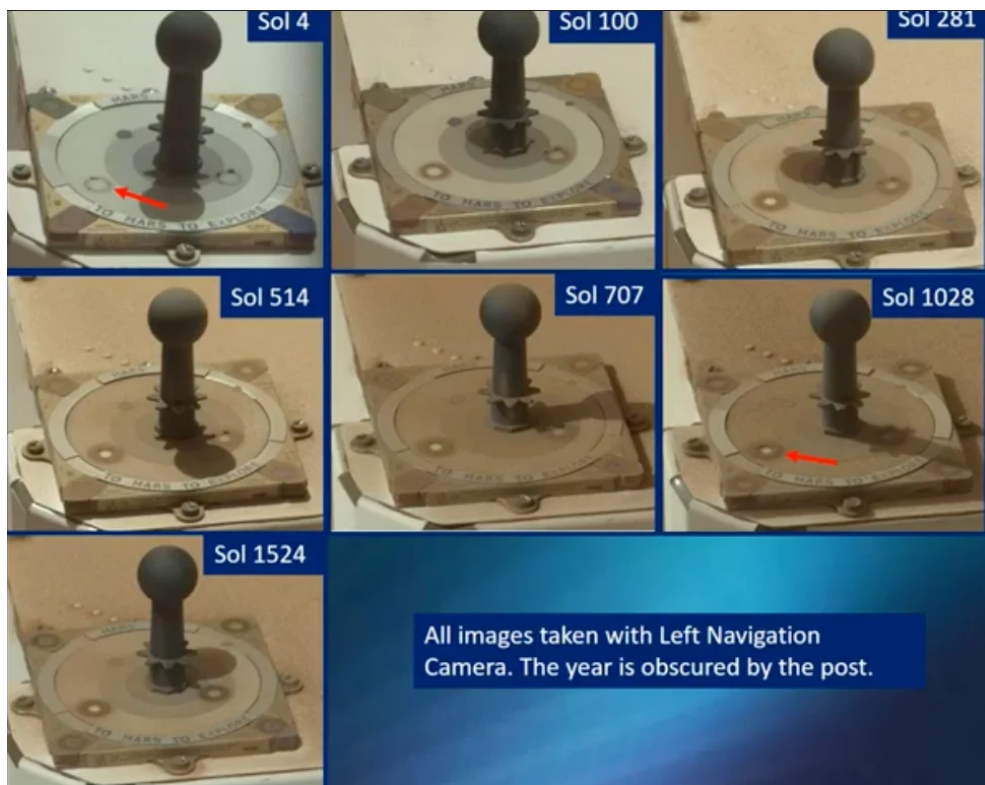
During landing (and this happened on February 18, 2021), we saw that the rover was descending, wrapped in Martian dust. We were almost convinced that there is a lot of dust in the atmosphere. What then will the rover look like a **month** after landing? Look at the photo - it will be pristine, as if a cleaning lady with a vacuum cleaner had just walked on it.

Mars Perseverance Sol 26: WATSON Camera



Эта фотография была выбрана общественным голосованием и представлена в качестве "Изображения недели" для **5 - й недели (14 марта-20 марта 2021 года)** миссии марсохода Perseverance на Марсе.

In the archives of NASA, you can find photographs showing how the horizontal surfaces of the rover are gradually covered with dust. This does not happen immediately, the first clear traces of settled sand will be visible after about 280 sols (sol is a Martian day, it lasts a little longer than Earth, 24 hours 40 minutes). That is, the effect will be noticeable after 280 days.



The color target is gradually covered with dust.

The color target is gradually covered with dust.

And after 2 Earth years, the dust will already lie in a noticeable layer. And when 4 years have passed (about 1500 sols), the dust seems to be even less.

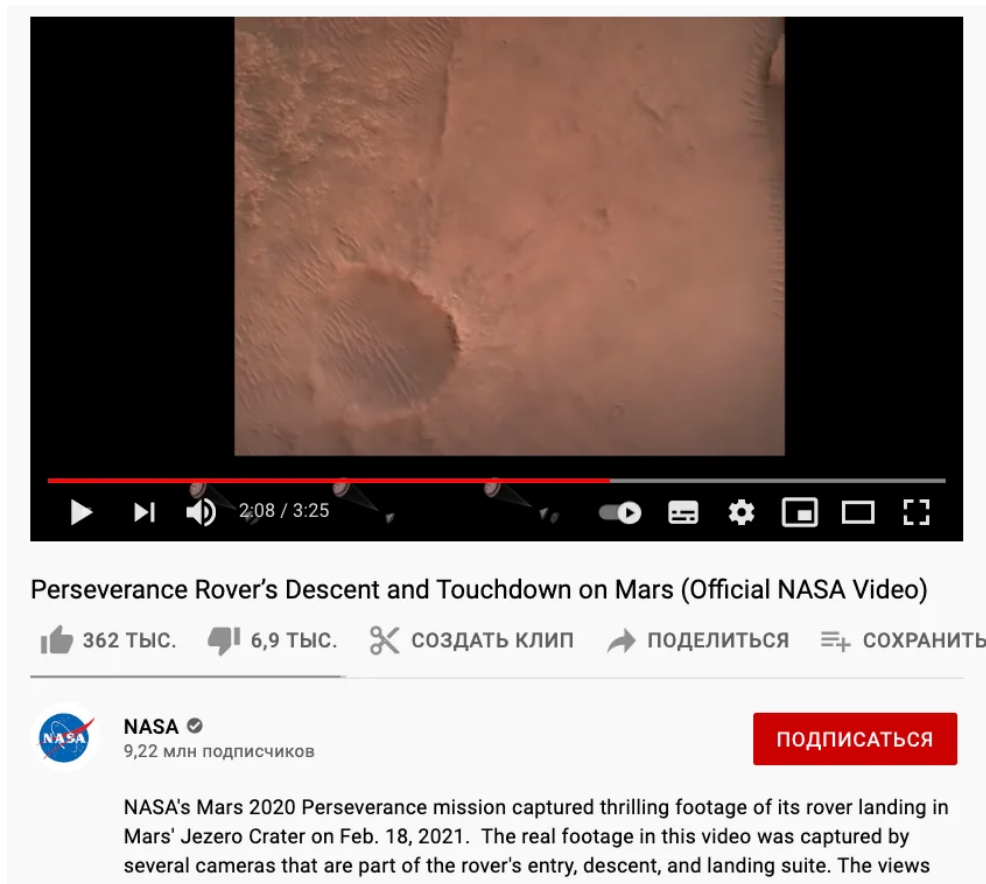
Apparently, the fallout of Martian dust occurs in approximately the same volumes as on Earth. When you leave for a business trip for a week or two, you return home, and the surface of the desk in the room is already covered with dust. And where does it come from with the windows closed? Probably, the same microscopic dust hovers on Mars.

Looked at the latest photos from the Perseverance rover. It has been on Mars for more than 3 months, and the horizontal surfaces of the rover are not dusty at all ... You can see little dust there. Or does a cleaning lady with a vacuum cleaner do the cleaning once a week?

And I'm not kidding about the cleaner with a vacuum cleaner. Maybe she really walks there. Because NASA, under the guise of real filming from Mars, shows a banal computer animation made on Earth, which is a shame to watch.

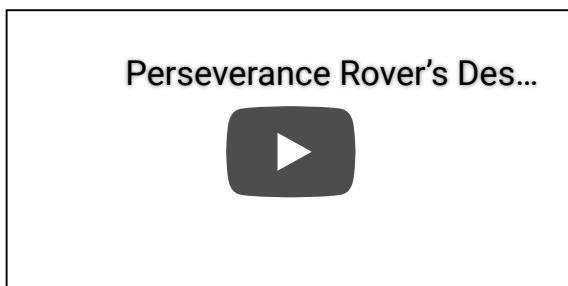
I reread the text under the official NASA video twice, even using the translator to make sure that NASA posted real footage - "the real

footage" - from Mars.



Well, what kind of real footage is this, if exactly the same footage of landing on Mars **has already been shown by NASA** a few days before the official demonstration of the "real footage" (real footage) of landing?

For example, in "the real footage" we see how the surface of Mars is getting closer and closer. I stopped the video at the moment of 2 min 08 s (see the picture above or video). We see a crater in the lower left corner.



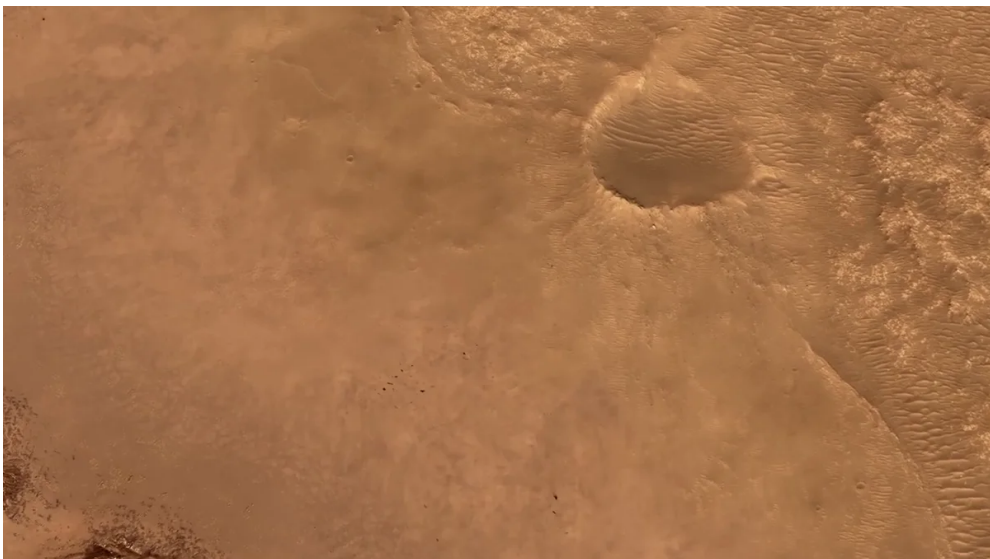
And here is the footage that was shown a few days before, in an animated video. We see the same crater, but here we understand that it is drawn on a computer.



A still from the cartoon about landing on Mars.

A still from the cartoon about landing on Mars.

Let's take a freeze frame from this cartoon (computer rendering) at time 1 min 57 sec.

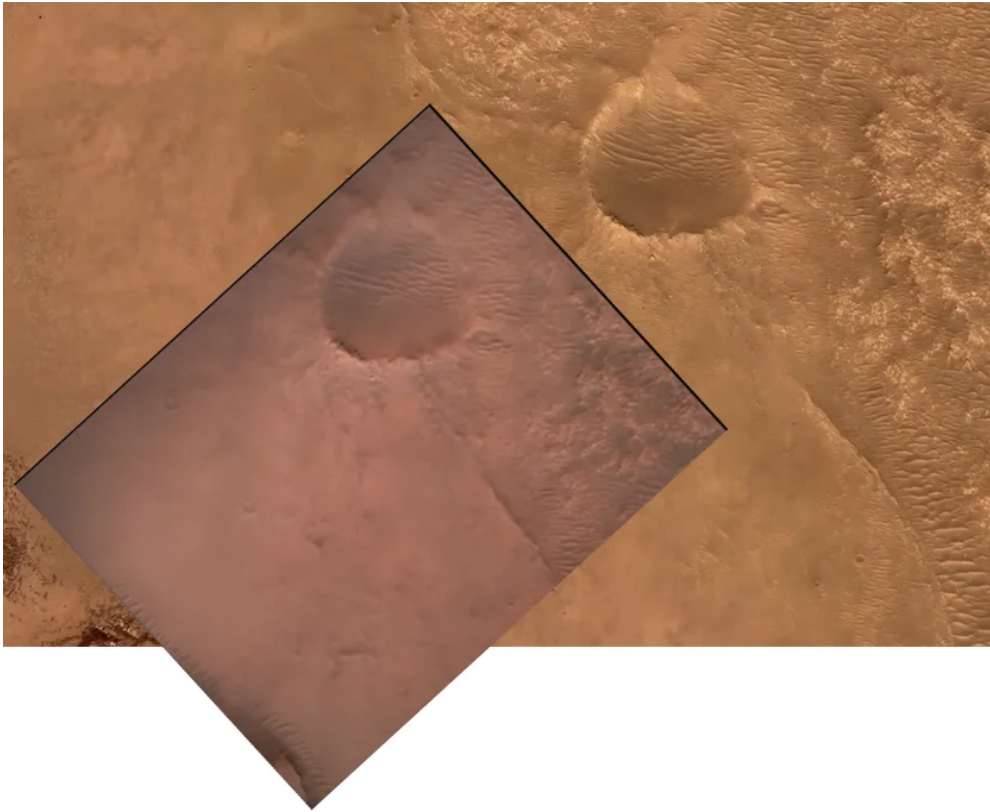


Freeze frame from the cartoon for 1 min 57s.

Freeze frame from the cartoon for 1 min 57s.

If we superimpose one frame on top of another, we will notice that the “real footage” (real descent) frame is the same computer drawing, only

rotated 135 degrees. The same shadows, the same direction of light, the same scale.



Two frames are completely identical - a frame from a cartoon (orange) and a frame from a real video footage "the real footage" (pink).

Two frames are completely identical - a frame from a cartoon (orange) and a frame from a real video footage "the real footage" (pink).

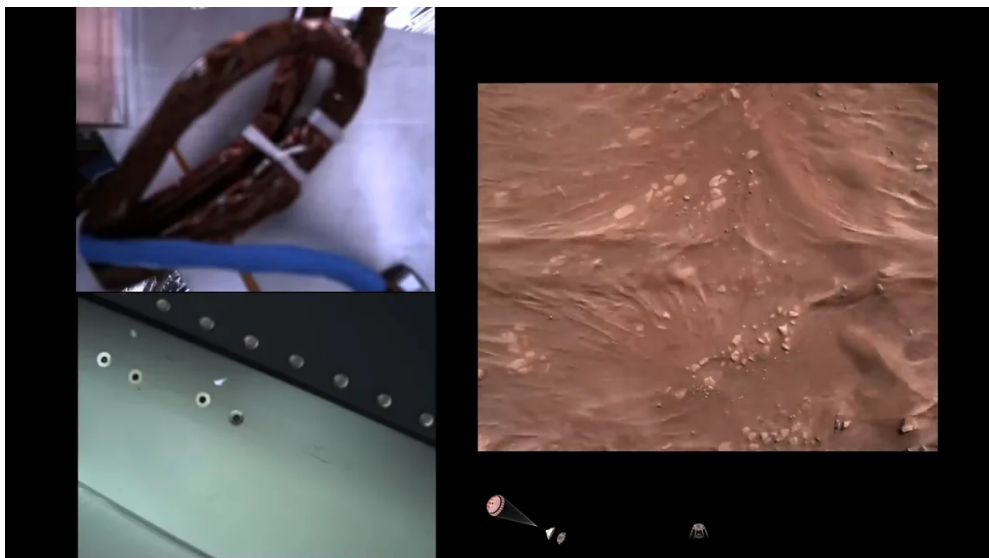
The descent to Mars itself, filmed with a supposedly real video camera, does not produce the feeling of a real descent, neither at the beginning nor at the end. We see at first, as it were, shooting off a protective heat shield (shield). But the fact that this is computer graphics is unambiguous.



The heat shield is fired back.

The heat shield is fired back.

Then we see the Martian mountains and craters as if from a height of 11 kilometers. Then the details are enlarged, as if the distance had decreased to 2-3 kilometers. But after a second it turns out that to the surface of Mars - only a few centimeters (the camera that records all this is attached, as it were, under the bottom of the rover) - we see that the "Martian" dust from the work of the engines has already begun to scatter.



A few tens of centimeters are left to the surface of Mars.

A few tens of centimeters are left to the surface of Mars.

In my opinion, the "real footage" of the rover landing on the surface of Mars was done simply carelessly. The fact that this is computer graphics, and not real video footage, can be seen with the naked eye.

And the rover itself sways on ropes as if it were a toy model. As Stanislavsky would say: "I don't believe!" I do not believe that this is footage from Mars.

I already foresee that in the morning trolls and foreign agents sitting on the payroll of the State Department will come running to this topic, who will furiously prove that the computer scientists who made the animation knew exactly where the Perseverance rover would land, and therefore reproduced the landing site very accurately. The computer scientists, who started working on this video six months (or a year) ago, knew the landing site with an accuracy of ten meters and the landing time with an accuracy of a second, so they correctly depicted both the direction of light and the length of the shadows. And the work of the computer scientists coincided perfectly with the "real" filming from Mars!

This is on Earth, when the spacecraft returns from near space (from the ISS, from an altitude of 350 km), they organize tracking and search operations, because from the late 1960s to the 21st century, the landing accuracy of Soyuz during normal, nominal descent is **$\pm 40 - 50$ km from the calculated point**. "And on Mars, American iPhones and iPads work, so with their help there are no problems to land a spacecraft on an unknown planet (200 million kilometers away from us) at a specified point with an accuracy of several meters. And even show it in advance using a computer. graphs of exactly what this place will look like!

There is another moment in this "real" video of the landing on Mars, which indicates that we are watching computer rendering, animation, and not real video footage. This is the moment when the "sky crane" was shot (many viewers wrote about this "bloopers"). Here the "sky crane" hovers over the surface of "Mars" at an altitude of about 20 meters and with the thrust of its engines holds the rover, which weighs more than a ton on Earth or half a ton in Mars conditions. At the moment when the three fastening cables break off and the weight held on the weight is dropped to the surface, the "sky crane" due to the "kickback" should immediately jerk upward.

As Mikhail wrote in the comments:

The flying platform was supposed to jump several meters up (abruptly!) After dropping the cargo (rover). Since the auto-regulation system would not have had time to compensate for such a change in the total mass of the platform due to the inertia of gas-dynamic engines.

But we do not see this. The "sky crane" behaves like a computer model, which did not react to a sudden change in weight, and slowly, without sudden jerks, began to gain altitude.

*

Cameraman L. Konovalov was with you. Until next time!

